

Claims

- [c1] What is claimed is:
1. Solder pads for improving reliability of a package, the package comprising a substrate, the solder pads comprising:
a plurality of first solder pads positioned on a surface of the substrate, each of the first solder pads having a first diameter; and
at least a second solder pad positioned on a predetermined region of the substrate surface, the second solder pad having a second diameter greater than the first diameter to sustain a stronger thermal stress and a stronger fatigue strength.
 - [c2] 2. The solder pads of claim 1 wherein the substrate comprises a plastic substrate.
 - [c3] 3. The solder pads of claim 1 wherein the substrate comprises a ceramic substrate.
 - [c4] 4. The solder pads of claim 1 wherein the substrate comprises a printed circuit board (PCB).
 - [c5] 5. The solder pads of claim 1 wherein the substrate comprises a chip.
 - [c6] 6. The solder pads of claim 1 wherein the predetermined region comprises a high stress region.
 - [c7] 7. The solder pads of claim 1 wherein the first solder pads are arranged in a matrix at a center region of the substrate.
 - [c8] 8. The solder pads of claim 1 wherein the predetermined region comprises the corners of the substrate.
 - [c9] 9. The solder pads of claim 1 wherein the predetermined region comprises the circumferences of a plurality of concentric circles on the substrate.
 - [c10] 10. The solder pads of claim 9 wherein the second solder pads on each of the concentric circle circumferences are arranged with an equal interval.

[c11] 11. The solder pads of claim 1 wherein the predetermined region comprises the corners of the substrate on an outside portion of a maximum circle on the substrate.

[c12] 12. The solder pads of claim 1 wherein the predetermined region comprises the circumference of a maximum circle on the substrate.

[c13] 13. The solder pads of claim 1 wherein the predetermined region comprises at least a grounded solder pad.

[c14] 14. The solder pads of claim 1 wherein each of the first solder pads and the second solder pad comprise a solder bump pad, the solder bump pad connecting to a solder bump and using the solder bump to connect to a chip.

[c15] 15. The solder pads of claim 14 wherein an underfill layer is filled in a gap between the chip and the substrate.

[c16] 16. The solder pads of claim 1 wherein each of the first solder pads and the second solder pad comprise a solder ball pad, the solder ball pad connecting to a solder ball and using the solder ball to connect to a printed circuit board.

[c17] 17. Solder pads comprising:
a substrate;
a plurality of first solder bump pads positioned on a first surface of the substrate, each of the first solder bump pads having a first diameter;
at least a second solder bump pad positioned on a first predetermined region of the first surface, the second bump solder pad having a second diameter greater than the first diameter;
a plurality of first solder ball pads positioned on a second surface of the substrate, each of the first solder ball pads having a third diameter; and
at least a second solder ball pad positioned on a second predetermined region of the second surface, the second solder ball pad having a second diameter greater than the third diameter.

[c18] 18. The solder pads of claim 17 wherein the substrate comprises a plastic substrate.

- [c19] 19. The solder pads of claim 17 wherein the substrate comprises a ceramic substrate.
- [c20] 20. The solder pads of claim 17 wherein the first predetermined region and the second predetermined region comprise a high stress region.
- [c21] 21. The solder pads of claim 17 wherein the first solder bump pads are arranged in a matrix at a center region of the substrate.
- [c22] 22. The solder pads of claim 17 wherein the first predetermined region comprises the corners on the first surface of the substrate.
- [c23] 23. The solder pads of claim 17 wherein the first predetermined region comprises the circumferences of a plurality of concentric circles on the first surface.
- [c24] 24. The solder pads of claim 23 wherein the second solder bump pads on each of the concentric circle circumferences are arranged with an equal interval.
- [c25] 25. The solder pads of claim 17 wherein the first predetermined region comprises the corners of the substrate on an outside portion of a maximum circle on the first surface.
- [c26] 26. The solder pads of claim 17 wherein the first predetermined region comprises the circumference of a maximum circle on the first surface.
- [c27] 27. The solder pads of claim 17 wherein the first surface is an upper surface of the substrate, each of the first solder bump pads and the second solder bump pad connecting to a solder bump and using the solder bump to connect to a chip.
- [c28] 28. The solder pads of claim 17 wherein the first solder ball pads are arranged in a matrix at a center region of the substrate.
- [c29] 29. The solder pads of claim 17 wherein the second predetermined region comprises the corners on the second surface of the substrate.
- [c30] 30. The solder pads of claim 17 wherein the second predetermined region

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comprises the circumferences of a plurality of concentric circles on the second surface.

[c31] 31. The solder pads of claim 30 wherein the second solder ball pads on each of the concentric circle circumferences are arranged with an equal interval.

[c32] 32. The solder pads of claim 17 wherein the second predetermined region comprises the corners of the substrate on an outside portion of a maximum circle on the second surface.

[c33] 33. The solder pads of claim 17 wherein the second predetermined region comprises the circumference of a maximum circle on the second surface.

[c34] 34. The solder pads of claim 17 wherein the second surface is a lower surface of the substrate, each of the first solder ball pads and the second solder ball pad connecting to a solder ball and using the solder ball to connect to a printed circuit board.

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